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#2(TDS)

Attorney Docket No.: NMTI 1002-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application

Inventor(s): Christophe Pierrat and Michel Luc Cote

Appl. No.: 09/932,239

Confirm. No.: 4845

Filed: 17 August 2001

Title: Phase Conflict Resolution for Photolithographic
Masks

Art Unit: 1756

Examiner: Unassigned

Customer No. 30437

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.56

Commissioner of Patents
Washington, DC 20231

Sir:

It is requested that the information identified in this statement be considered by the Examiner and made of record in the above-identified application. This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, material to patentability as defined in 37 C.F.R. §1.56. If this is a continuation, divisional or continuation-in-part application, it is understood that the Examiner will consider all information which was considered by the Office in a parent application. MPEP §609. Such information therefore is not listed herein unless it is desired that the information be printed on a patent issuing from the subject application.

Enclosed with this statement are the following:

- ✓ Form PTO-1449. The Examiner is requested to initial the form and return it to the undersigned in accordance with M.P.E.P. §609.
- ✓ A copy of each cited document as required by 37 C.F.R. §1.98. Copies are not submitted of documents previously submitted by the applicant in a parent application from which benefit under 35 U.S.C. §120 is claimed, 37 C.F.R. §1.98(d)(1), with an information disclosure statement submitted in the parent application which complies with the Sept. 8, 2000 or subsequent revision of 37 C.F.R. §1.98(a-c). If any of the cited/submitted documents is in a foreign language, a concise explanation of relevance is provided pursuant to 37 C.F.R. §1.98(a)(3)(i). For foreign language documents cited in a search report by a foreign patent office, the requirement for a concise explanation of relevance is satisfied by the submission herewith of an English language version of the search report. MPEP §609A(3). If a written English-language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in §1.56(c), a copy of the translation accompanies this statement, 37 C.F.R. §1.98(a)(3)(ii), and satisfies the requirement for a concise explanation of relevance, MPEP §609A(3).

— **PTA Statement under 37 C.F.R. §704(d).** Each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart application and that this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement.

This statement should be considered because:

✓ **37 C.F.R. §1.97(b).** This statement qualifies under 37 C.F.R. §1.97, subsection (b) because:

- (1) It is being filed within three months of the filing date of an application other than a continued prosecution application under § 1.53(d);
-- OR --
- (2) It is being filed within 3 months of entry of a national stage;
-- OR --
- (3) It is being filed before the mailing date of the first Office Action on the merits,
-- OR --
- (4) It is being filed before the mailing date of the first Office Action after the filing of a Request for Continued Examination under 37 C.F.R. §1.114.

— **37 C.F.R. §1.97(c).** Although it may not qualify under subsection (b), this statement qualifies under 37 C.F.R. §1.97, subsection (c) because:

- (1) It is being filed before the mailing date of a FINAL office action, a Notice of Allowance, or an action that otherwise closes prosecution in the subject application, whichever occurs first.

-- AND (check at least one of the following) --

- (1) It is accompanied by a STATEMENT as set forth in 37 C.F.R. §1.97(e).
-- OR --
— (2) It is accompanied by the \$180 fee set forth in 37 C.F.R. §1.17(p).

— **37 C.F.R. §1.97(d).** Although it may not qualify under subsection (b) or (c), this statement qualifies under 37 C.F.R. §1.97, subsection (d) because:

- (1) It is being filed on or before payment of the issue fee;
-- AND --
- (2) It is accompanied by a STATEMENT as set forth in 37 C.F.R. §1.97(e);
-- AND --
- (3) It is accompanied by the \$180 fee set forth in 37 C.F.R. §1.17(p).

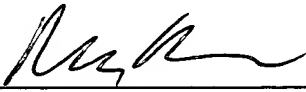
Application No. 09/932,239

✓ **Fee Authorization.** The Commissioner is hereby authorized to charge underpayment of any additional fees or credit any overpayment associated with this communication to Deposit Account No. 50-0869. A duplicate copy of this authorization is enclosed.

Respectfully submitted,

HAYNES BEFFEL & WOLFELD LLP

Date: 13 March 2002

By: 
Mark A. Haynes, Reg. No. 30,846

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INFORMATION DISCLOSURE CITATION PTO-1449			Atty. Docket No. NMTI 1002-3 Applicant PIERRAT, Christophe Filing Date 8/17/2001 Serial No. 09/932,239 Group 1756 Not Yet Assigned			
U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	4,037,918	7/26/1977	Kato	350	3.5	7/31/1975
	4,456,371	6/26/1984	Lin	355	71	6/30/1982
	5,302,477	4/12/1994	Dao, et al.	430	5	8/21/1992
	5,308,741	5/3/1994	Kemp	430	312	7/31/1992
	5,316,878	5/31/1994	Saito, et al.	430	5	6/4/1992
	5,324,600	6/28/1994	Jinbo, et al.	430	5	7/7/1992
	5,328,807	7/12/1994	Tanaka, et al.	430	311	6/7/1991
	5,334,542	8/2/1994	Saito, et al.	437	40	11/18/1992
	5,352,550	10/4/1994	Okamoto	430	5	4/23/1993
	5,364,716	11/15/1994	Nakagawa, et al.	430	5	9/3/1992
	5,424,154	6/13/1995	Borodovsky	430	5	12/10/1993
	5,480,746	1/2/1996	Jinbo, et al.	430	5	5/16/1994
	5,496,666	3/5/1996	Chu, et al.	430	5	10/27/1994
	5,498,579	3/12/1996	Borodovsky, et al.	437	250	6/8/1994
	5,503,951	4/2/1996	Flanders, et al.	430	5	4/17/1995
	5,523,186	6/4/1996	Lin, et al.	430	5	12/16/1994
	5,527,645	6/18/1996	Pati, et al.	430	5	11/17/1994
	5,532,090	7/2/1996	Borodovsky	430	5	3/1/1995
	5,537,648	7/16/1996	Liebmann, et al.	395	500	8/15/1994
	5,538,815	7/23/1996	Oi, et al.	430	5	9/14/1993
	5,539,568	7/23/1996	Lin, et al.	359	285	6/7/1995
	5,565,286	10/15/1996	Lin	430	5	11/17/1994
	5,573,890	11/12/1996	Spence	430	311	7/18/1994

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	PIERRAT, Christophe	
	Filing Date	Group
	8/17/2001	1756 Not Yet Assigned

U.S. PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	5,595,843	1/21/1997	Dao	430	5	3/30/1995
	5,620,816	4/15/1997	Dao	430	5	10/13/1995
	5,635,316	6/3/1997	Dao	430	5	10/13/1995
	5,636,131	6/3/1997	Liebmann, et al.	364	490	5/12/1995
	5,702,848	12/30/1997	Spence	430	5	8/23/1996
	5,725,969	3/10/1998	Lee	430	5	12/22/1995
	5,761,075	6/2/1998	Oi, et al.	364	488	5/31/1996
	5,766,804	6/16/1998	Spence	430	5	8/23/1996
	5,766,806	6/16/1998	Spence	430	5	9/9/1996
	5,807,649	9/15/1998	Liebmann, et al.	430	5	10/31/1996
	5,827,623	10/27/1998	Ishida, et al.	430	5	10/30/1996
	5,858,580	1/12/1999	Wang, et al.	430	5	9/17/1997
	5,885,734	3/23/1999	Pierrat, et al.	430	5	8/15/1996
	5,923,566	6/13/1999	Galan, et al.	364	489	3/25/1997
	5,994,002	11/30/1999	Matsuoka	430	5	9/4/1997
	5,998,068	12/7/1999	Matsuoka	430	5	1/27/1998
	6,004,702	12/21/1999	Lin	430	5	5/21/1998
	6,010,807	1/4/2000	Lin	430	5	4/7/1998
	6,057,063	5/2/2000	Liebmann, et al.	430	5	4/14/1997
	6,066,180	5/23/2000	Kim, et al.	716	19	3/15/1999
	6,077,630	6/20/2000	Pierrat	430	5	1/8/1998
	6,083,275	7/4/2000	Heng, et al.	716	19	1/9/1998
	6,228,539 B1	5/8/2001	Wang, et al.	430	5	1/12/1999

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EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	6,251,549 B1	6/26/2001	Levenson	430	11	10/28/1999
	6,258,493 B1	7/10/2001	Wang, et al.	430	5	7/17/2000

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FOREIGN PATENT DOCUMENTS

EXAMINER'S INITIALS	PATENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	JP 6-67403	3/11/1994	JP			<input checked="" type="checkbox"/>	<input type="checkbox"/>
	0 698 821	2/28/1996	EPO			<input type="checkbox"/>	<input type="checkbox"/>
	8-51068	2/20/1996	JP			<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	2,650,962	5/16/1997	JP			<input type="checkbox"/>	<input type="checkbox"/>
	EP 0 464 492 A1	1/8/1992	EP			<input type="checkbox"/>	<input type="checkbox"/>
	EP 0 653 679 A2	5/17/1995	EP			<input type="checkbox"/>	<input type="checkbox"/>
	7-111528	2/14/1991	JP			<input type="checkbox"/>	<input type="checkbox"/>
	8-236317	9/6/1996	JP			<input type="checkbox"/>	<input type="checkbox"/>
	10-133356	5/22/1998	JP			<input type="checkbox"/>	<input type="checkbox"/>
	11-143085	5/28/1999	JP			<input type="checkbox"/>	<input type="checkbox"/>
	JP 62067547	3/27/1987	JP			<input type="checkbox"/>	<input type="checkbox"/>
	DE 195 45 163 A1	6/5/1996	DE			<input type="checkbox"/>	<input type="checkbox"/>

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
EXAMINER'S INITIALS	CITATION		
	Ackmann, P., et al., "Phase Shifting and Optical Proximity Corrections to Improve CD Control on Logic Devices in Manufacturing for Sub 0.35 um I-Line", Advance Micro Devices (8 pages).		
	Matsuoka, K., et al., "Application of Alternating Phase-Shifting Mask to 0.16um CMOS Logic Gate Patterns", Matsushita Electric Ind. Co., Ltd. (9 pages).		
	Spence, C., et al., "Detection of 60(degree) Phase Defects on Alternating PSMs", Advanced Micro Devices, KLA-Tencor, DuPont RTC (2 pages).		
	Sugawara, M., et al., "Defect Printability Study of Attenuated Phase-Shifting Masks for Specifying Inspection Sensitivity", Sony Corporation, Kanagawa, Japan (16 pages).		
	Schmidt, R., et al., "Impact of Coma on CD Control for Multiphase PSM Designs", AMD, ASML (11 pages).		
	Erdmann, A., "Topography Effects and Wave Aberrations in Advanced PSM-Technology", Fraunhofer Institute of Integrated Circuits (11 pages).		
	Granik, Y., et al., "CD Variation Analysis Technique and its Application to the Study of PSM Mask Misalignment", Mentor Graphics (9 pages).		
	Hanyu, et al., "New Phase-Shifting Mask with Highly Transparent SiO2 Phase Shifters", Fujitsu Laboratories Ltd. (11 pages).		
	Ishiwata, N., et al., "Fabrication of Phase-Shifting Mask", Fujitsu Limited (11 pages).		
	Levenson, M., et al., "Phase Phirst! An Improved Strong-PSM Paradigm", M.D. Levenson Consulting, Petersen Advanced Lithography, KLA-Tencor (10 pages).		
	Levenson, M., et al., "SCAA Mask Exposures and Phase Phirst Design for 110nm and Below", M.D. Levenson Consulting, Canon USA, Inc., JSR Microelectronics, Inc. (10 pages).		
	Lin, B.J., "The Relative Importance of the Building Blocks for 193nm Optical Lithography", Linnovation, Inc. (12 pages).		
	McCallum, M., et al., "Alternating PSM Mask Performance - a Study of Multiple Fabrication Technique Results", International SEMATECH (6 pages).		
	Morikawa, Y., et al., "100nm-alt.PSM Structure Discussion for ArF Lithography", Dai-Nippon Printing Co., Ltd. (15 pages).		

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EXAMINER'S INITIALS	CITATION		
	Ozaki, T., et al., "A 0.15um KrF Lithography for 1Gb DRAM Product Using Highly Printable Patterns and Thin Resist Process", Toshiba Corporation (2 pages).		
	Rhyins, P., et al., "Characterization of Quartz Etched PSM Masks for KrF Lithography at the 100nm Node", Photonics, Inc., MIT Lincoln Lab, ARCH Chemicals, Finle Technologies, KLA-Tencor Corp. (10 pages).		
	Ronse, K., et al., "Thin Film Interference Effects in Phase Shifting Masks Causing Phase and Transmittance Errors", IMEC (15 pages).		
	Rosenbluth, A., et al., "Optimum Mask and Source Patterns to Print a Given Shape", IBM (17 pages).		
	Sakata, M., et al., "A Novel Radiation Sensitive Spin-on-Glass Convertible into SiO ₂ and the Simple Fabrication Process Using It", Oki Electric Industry Co. Ltd. (3 pages).		
	Schmidt, R., et al., "Impact of Coma on CD Control for Multiphase PSM Designs", AMD, ASML (10 pages).		
	Sewell, H., et al., "An Evaluation of the Dual Exposure Technique", SVG Lithography Systems Inc. (11 pages).		
	Spence, C., et al., "Optimization of Phase-Shift Mask Designs Including Defocus Effects", AMD, Princeton University, Vecor Technologies Inc. (8 pages).		
	Suzuki, A., et al., "Multilevel Imaging System Realizing k1=0.3 Lithography", Canon Inc. (13 pages).		
	Vandenberghe, G., et al., "(Sub-)100nm Gate Patterning Using 248nm Alternating PSM", IMEC, Mentor Graphics (9 pages).		
	Fritze, M., et al., "100-nm Node Lithography with KrF?", MIT Lincoln Lab, Numerical Technologies, Photonics, Arch Chemicals (14 pages).		
	Fukuda, H., et al., "Patterning of Random Interconnect Using Double Exposure of Strong-Type PSMs", Hitachi Central Research Lab (8 pages).		
	Ferguson, R., et al., "Pattern-Dependent Correction of Mask Topography Effects for Alternating Phase-Shifting Masks", IBM Microelectronics, University of California Berkeley (12 pages).		
	Touban, O., et al., "Phase and Transmission Errors Aware OPC Solution for PSM: Feasibility Demonstration", Mentor Graphics Corp. (7 pages).		

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	Yanagishita, Y., et al., "Phase-Shifting Photolithography Applicable to Real IC Patterns", Fujitsu Limited (11 pages).		
	Levenson, M., et al., "Improving Resolution in Photolithography with a Phase-Shifting Mask", IEEE, Transactions On Electron Devices, Vol. ED-29, No. 12, pp. 1828-1836, December 1982.		
	Levenson, M., et al., "The Phase-Shifting Mask II: Imaging Simulations and Submicrometer Resist Exposures", IEEE Transactions on Electron Devices, Vol. ED-31, No. 6, pp. 753-763, June 1984.		
	IBM, "Method to Produce Sizes in Openings in Photo Images Smaller Than Lithographic Minimum Size", IBM Technical Disclosure Bulletin, Vol. 29, No. 3, p. 1328, august 1986.		
	Terasawa, T., et al., "0.3-Micron Optical Lithography Using a Phase-Shifting Mask", SPIE, Optical/Laser Microlithography II, Vol. 1088, pp. 25-33, March 1989.		
	Buraschi, M., et al., "Optical-Diffraction-Based Modulation of Photoresist Profile or Microlithography Applications", Optical Engineering, Vol. 28, No. 6, pp. 654-658, June 1989.		
	Nitayama, A., et al., "New Phase Shifting Mask with Self-Aligned Phase Sifters for a Quarter Micron Photolithography", IEDM, pp. 3.3.1-3.3.4, December 3-6, 1989.		
	Jinbo, H., et al., "0.2um or Less i-Line Lithography by Phase-Shifting-Mask Technology", IEEE, pp. 33.3.1-33.3.4 (1990).		
	Neureuther, A., "Modeling Phase Shifting Masks", SPIE, 10th Annual Symposium On Microlithography, Vol. 1496, pp. 80-85 (1990).		
	Toh, K., et al., "Chromeless Phase-Shifted Masks: A New Approach to Phase-Shifting Masks", BACUS - Tenth Annual Symposium on Microlithography, September 1990 (27 pages).		
	Yamanaka, T., et al., "A 5.9um ² Super Low Power SRAM Cell Using a New Phase-Shift Lithography", IEDM, pp. 18.3.1-18.3.4 (1990).		
	Nakagawa, K., et al., "Fabrication of 64m DRAM with I-Line Phase-Shift Lithography", IEDM, pp. 33.1.1-33.1.4 (1990).		
	Watanabe, H., et al., "Transparent Phase Shifting Mask", IEDM, pp. 33.2.1-33.2.4 (1990).		
	Inokuchi, K., et al., "Sub-Quarter Micron Gate Fabrication Process Using Phase-Shifting-Mask for Microwave GaAs Devices", Extended Abstracts Of The 1991 Intl. Conference On Solid State Devices And Materials, Yokohama, Japan, pp. 92-94 (1991).		

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	Inokuchi, K., et al., "Sub-Quarter-Micron Gate Fabrication Process Using Phase-Shifting Mask for Microwave GaAs Devices", Japanese Journal Of Applied Physics, Vol. 30, No. 12B, pp. 3818-3821, December 1991.		
	Jinbo, H., et al., "Improvement of Phase-Shifter Edge Line Mask Method", Japanese Journal Of Applied Physics, Vol. 30, No. 11B, pp. 2998-3003, November 1991.		
	Kimura, T., et al., "Subhalf-Micron Gate GaAs Mesfet Process Using Phase-Shifting-Mask Technology", IEEE, GaAs IC Symposium, pp. 281-284 (1991).		
	Wiley, J., et al., "Phase Shift Mask Pattern Accuracy Requirements and Inspection Technology", SPIE, Integrated Circuit Metrology, Inspection, And Process Control V, Vol. 1464, pp. 346-355 (1991).		
	Burggraaf, P., "Four More Significant Japanese Advances in Phase Shifting Technology", Semiconductor International, p. 16, December 1991.		
	Kemp, K., et al., "Optimized Phase Shift Mask Designs for Real Devices", KTI Microlithography Seminar, pp. 67-75, October 14-15, 1991.		
	Newmark, D., et al., "Phase-Shifting Mask Design Tool", SPIE - 11th Annual BACUS Symposium on Photmask Technology, Vol. 1604, pp. 226-235, September 25-27, 1991.		
	Nolscher, C., et al., "Investigation of Self-Aligned Phase-Shifting Reticles by Simulation Techniques", SPIE - Optical/Laser Microlithography IV, Vol. 1463, pp. 135-150 (1991).		
	Asai, S., et al., "High Performance Optical Lithography Using a Separated Light Source", J. Vac. Sci. Technol. B, Vol. 10, No. 6, pp. 3023-3026, November/December 1992.		
	Jinbo, H., et al., "Application of Blind Method to Phase-Shifting Lithography", IEEE, 1992 Symposium On VLSI Technology Digest Of Technical Papers, pp. 112-113 (1992).		
	Ohtsuka, H., et al., "Phase Defect Repair Method for Alternating Phase Shift Masks Conjugate Twin-Shifter Method", Jpn. J. Appl. Phys., Vol. 31, pp. 4143-4149 (1992).		
	Pierrat, C., et al., "Phase-Shifting Mask Topography Effects on Lithographic Image Quality", IEEE, pp. 3.3.1-3.3.4 (1992).		
	Watanabe, H., et al., "Detection and Printability of Shifter Defects in Phase-Shifting Masks II Defocus Characteristics", Jpn. J. Appl. Phys., Vol. 31, pp. 4155-4160 (1992).		
	Burggraaf, P., "Lithography's Leading Edge, Part 1: Phase-Shift Technology and Part 2: I-Line and Beyond", Semiconductor International, pp. 43-47 and 52-56, February 1992.		

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	Hosono, K., et al., "A Novel Architecture for High Speed Dual Image Generation of Pattern Data for Phase Shifting Reticle Inspection", SPIE - Integrated Circuit Metrology, Inspection, and Process Control VI, Vol. 1673, pp. 229-235 (1992).		
	IBM, "Phase-Shift Mask Utilizing Silicon Oxy-Nitride as a Low Reflectivity Phase-Shift Layer", IBM Technical Disclosure Bulletin, Vol. 34, No. 10B, pp. 360-361, March 1992.		
	Brunner, T., et al., "170nm Gates Fabricated by Phase-Shift Mask and Top Anti-Reflector Process", SPIE, Optical/Laser Microlithography VI, Vol. 1927, pp. 182-189 (1993).		
	Brunner, T., "Rim Phase-Shift Mask Combined with Off-Axis Illumination: A Path to 0.5(lampda) / Numerical Aperture Geometries", Optical Engineering, Vol. 32, No. 10, pp. 2337-2343, October 1993.		
	Lin, B.J., "Phase-Shifting Masks Gain an Edge", IEEE Circuits & Devices, pp. 28-35, March 1993.		
	Liu, H.Y., et al., "Fabrication of 0.1um T-Shaped Gates by Phase-Shifting Optical Lithography", SPIE, Optical/Laser Microlithography VI, Vol. 1927, pp. 42-52 (1993).		
	Nistler, J., et al., "Phase Shift Mask Defect Printability Analysis", Proceedings Of The Microlithography Seminar INTERFACE '93, OCG Microelectronic Materials, Inc., pp. 11-28 (1993).		
	Rieger, M., et al., "System for Lithography Proximity Compensation", Precim Company, Portland, Oregon, September 1993 (28 pages).		
	Ronse, K., et al., "Comparison of Various Phase Shift Strategies and Application to 0.35um ASIC Designs", SPIE - Optical/Laser Microlithography VI, Vol. 1927, pp. 2-16 (1993).		
	Troccolo, P., et al., "Interferometric Measurement of Etch Depths in Phase Shift Masks", BACUS News, Vol. 9, Issue 6, pp. 1 & 4-6, June 1993.		
	Watanabe, H., et al., "Phase-Shifting Lithography: Maskmaking and its Application", J. Vac. Sci. Technol. B, Vol. 11, No. 6, pp. 2669-2674, November/December 1993.		
	Galan, G., et al., "Application of Alternating-Type Phase Shift Mask to Polysilicon Level for Random Logic Circuits", Jpn. J. Appl. Phys., Vol. 33, pp. 6779-6784 (1994).		
	Mizuno, F., et al., "Practical Phase-Shifting Mask Technology for 0.3um Large Scale Integrations", J. Vac. Sci. Technol. B, Vol. 12, No. 6, pp. 3799-3803, November/December 1994.		
	Nistler, J., et al., "Large Area Optical Design Rule Checker for Logic PSM Application", SPIE, Photomask And X-Ray Mask Technology, Vol. 2254, pp. 78-92 (1994).		

EXAMINER: _____

Date Considered: _____

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INFORMATION DISCLOSURE CITATION PTO-1449		Atty. Docket No. NMTI 1002-3	Serial No. 09/932,239
		Applicant PIERRAT, Christophe	Filing Date 8/17/2001
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
EXAMINER'S INITIALS	CITATION		
	Pati, Y.C., et al., "Phase-Shifting Masks for Microlithography: Automated Design and Mask Requirements", J. Opt. Soc. Am., Vol. 11, No. 9, pp. 2438-2452, September 1994.		
	Pierrat, C., et al., "A Rule-Based Approach to E-Beam and Process-Induced Proximity Effect Correction for Phase-Shifting Mask Fabrication", SPIE, Vol. 2194, pp. 298-309 (1994).		
	Spence, C., et al., "Automated Determination of CAD Layout Failures Through Focus: Experiment and Simulation", SPIE, Vol. 2197, pp. 302-313 (1994).		
	Stirniman, J., et al., "Wafer Proximity Correction and Its Impact on Mask-Making", Bacus News, Vol. 10, Issue 1, pp. 1, 3-7, 10-12, January 1994.		
	Waas, T., et al., "Automatic Generation of Phase Shift Mask Layouts", Microelectronic Engineering, Vol. 23, pp. 139-142 (1994).		
	Barouch, E., et al., "OPTIMASK: An OPC Algorithm for Chrome and Phase-Shift Mask Design", SPIE, Vol. 2440, pp. 192-206, February 1995.		
	Karklin, L., "A Comprehensive Simulation Study of the Photomask Defects Printability", SPIE, Vol. 2621, pp. 490-504 (1995).		
	Langston, J., et al., "Extending Optical Lithography to 0.25um and Below", Solid State Technology, pp. 57-64, March 1995.		
	Nagahiro, Y., "Improved Mask Technique for Photolithography Applied to 0.25um LSI - Improvement of Resolution, Pattern Correction, Exposure Area", Nikkei Microdevices, pp. 1-6, April 1995.		
	Okamoto, Y., et al., "A New Phase Shifting Mask Technology for Quarter Micron Photolithography", SPIE, Vol. 2512, pp. 311-318 (1995).		
	Pierrat, C., et al., "Required Optical Characteristics of Materials for Phase-Shifting Masks", Applied Optics, Vol. 34, No. 22, pp. 4923-4928, August 1, 1995.		
	Galan, G., et al., "Alternating Phase Shift Generation for Complex Circuit Designs", SPIE, Vol. 2884, pp. 508-519, September 18-20, 1996.		
	Kanai, H., et al., "Sub-Quarter Micron Lithography with the Dual-Trench Type Alternating PSM", SPIE, Vol. 2793, pp. 165-173 (1996).		
	Ishiwata, N., et al., "Novel Alternating Phase Shift Mask with Improved Phase Accuracy", SPIE, Proceedings Of The 17th Annual Symposium On Photomask Technology And Management, Vol. 3236, pp. 243-249 (1997).		

EXAMINER: _____

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	OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)	
EXAMINER'S INITIALS	CITATION	
	Morimoto, H., et al., "Next Generation Mask Strategy - Technologies are Ready for Mass Production of 256MDRAM?", SPIE, Vol. 3236, pp. 188-189 (1997).	
	Roman, B., et al., "Implications of Device Processing on Photomask CD Requirements", SPIE, Vol. 3236 (1997) (Abstract Only).	
	Ishida, S., et al., "Large Assist Feature Phase-Shift Mask for Sub-Quarter Micrometer Window Pattern Formation", SPIE, Vol. 3096, pp. 333-343 (1997).	
	Nakae, A., et al., "A Proposal for Pattern Layout Rule in Application of Alternating Phase Shift Mask", SPIE, Vol. 3096, pp. 362-374 (1997).	
	Tsujimoto, E., et al., "Hierarchical Mask Data Design System (PROPHET) for Aerial Image Simulation, Automatic Phase-Shifter Placement, and Subpeak Overlap Checking", SPIE, Vol. 3096, pp. 163-172 (1997).	
	Yamamoto, K., et al., "Hierarchical Processing of Levenson-Type Phase Shifter Generation", Jpn. J. Appl. Phys., Vol. 36, Part 1, No. 12B, pp. 7499-7503, December 1997.	
	Gordon, R., et al., "Design and Analysis of Manufacturable Alternating Phase-Shifting Masks", Bacus News, Vol. 14, Issue 12, pp. 1-9, December 1998.	
	Nara, M., et al., "Phase Controllability Improvement for Alternating Phase Shift Mask", Dai Nippon Printing Co., Ltd. (16 pages).	
	Petersen, J., et al., "Designing Dual-Trench Alternating Phase-Shift Masks for 140nm and Smaller Features Using 248-nm KrF and 193-nm ArF Lithography", Bacus News, Vol. 14, Issue 8, pp. 1 & 4-13, August 1998.	
	Fukuda, H., et al., "Determination of High-Order Lens Aberration Using Phase/Amplitude Linear Algebra", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3318-3321, November/December 1999.	
	Fukuda, H., "Node-Connection/Quantum Phase-Shifting Mask: Path to Below 0.3um Pitch, Proximity Effect Free, Random Interconnects and Memory Patterning", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3291-3295, November/December 1999.	
	Spence, C., et al., "Integration of Optical Proximity Correction Strategies in Strong Phase Shifters Design for Poly-Gate Layers", Bacus News, Vol. 15, Issue 12, pp. 1, 4-13, December 1999.	
	Kuo, C., et al., "Extension of Deep-Ultraviolet Lithography for Patterning Logic Gates Using Alternating Phase Shifting Masks", J. Vac. Sci. Technol. B, Vol. 17, No. 6, pp. 3296-3300, November/December 1999.	
	Palmer, S., et al., "Dual Mask Model-Based Proximity Correction for High Performance 0.10um CMOS Process", The 44th International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication Abstracts, pp. 18-19, May 30-June 2, 1999.	

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	Pierrat, C., "Investigation of Proximity Effects in Alternating Aperture Phase Shifting Masks", Numerical Technologies, Inc. (11 pages).		
	Cote, M., et al., "A Practical Application of Full-Feature Alternating Phase-Shifting Technology for a Phase-Aware Standard-Cell Design Flow", Numerical Technologies Inc. (6 pages).		
	Heng, F., et al., "Application of Automated Design Migration to Alternating Phase Shift Mask Design", IBM Research Report RC 21978 (98769), February 26, 2001 (7 pages).		
	Wong, A., et al., "Alternating Phase-Shifting Mask with Reduced Aberration Sensitivity: Lithography Considerations", Proc. SPIE, Vol. 4346, pp. 1-9 (2001).		

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